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LONG-BURNING LAMP

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[Abstract]

A long-burning lamp is disclosed which features a dish-like vessel in which a wick is located and which is filled with solid or pasty (at room temperature) or with liquid combustible material. The wick consists at least in part or predominantly of inorganic, noncombustible material and is thus reusable.

Description

The invention pertains to a long-burning lamp which has a dish-like vessel in which a wick is located and which is filled with solid or pasty (at room temperature) or with liquid combustible material.

Long-burning lamps of this kind are known, for example, as tea lights, in which a compressed element of paraffin is located in the dish-like vessel, and into which a wick is inserted. At the lower end of the wick there is a wafer-like wick container so that the wick will

retain its vertical position even when the paraffin of the compressed element has melted and become fluid during the burning of the lamp. The wick consists of paraffin-saturated cotton material and burns up with the paraffin, so that it cannot be reused.

In these known tea lights the visible flame disappears with the wick as it becomes shorter as it burns up, and decreases with the falling level of paraffin in the dish, and ultimately, for example in wind lamps in which these tea lights are used, or even in other lighting elements, it will not be sufficiently visible, if at all. Also during the burn up of the tea light, in the lower portion of the vessel some high temperatures are produced which represent a certain fire hazard. In each of the known tea lights, after the burn out, the little dish and wick holder are left over and they cannot be reused and thus have to be cleaned out or even discarded, which increases the amount of trash.

In a known candle as a kind of tea light (DE 34 03 604 A1) the wick is made of a cotton thread and is located in an upright standing tube which is permeable to liquid combustible material, and within this tube there is a suction-shaped element surrounding the wick. This element is used for the intake of liquefied combustible material such as molten wax. The tube surrounding the wick keeps the flame from sinking with the falling level of combustible material. But the tube cannot prevent the wick thread made of cotton material from burning away with the candle, so that the wick cannot be reused. This known candle cannot be lighted again once it has been extinguished after partial burn up, and the wax remaining in the dish-like vessel will solidify because in the vicinity of the upper end of the wick where the flame is burning, there will then not be enough wax to supply the flame until the wax surrounding the wick has softened and can be moved upward to the flame through the suction-like element surrounding the wick. This known candle is likewise intended only for one-time use, i.e., after burn up of the combustible material filled in the dish-like vessel, such as wax, the dish-like vessel with the wick holder and wick located therein cannot be used again.

The invention is based on the problem of creating a long-burning lamp in which the flame will always burn at the same height and in which the solid combustible material can be replenished, so that the lamp can be reused.

This problem is solved according to this invention by a long-burning lamp of the kind described in the introduction, which has the properties specified in Claim 1. Favorable refinements of the invention are the subject of the dependent claims.

Due to the invention a long-burning lamp such as a tea light is created in which the wick consists at least in part, or mostly of inorganic material and the flame does not drop downward with the drop in the level of combustible material such as the level of the wax, but rather always burns at the same level.

The combustible material is preferably paraffin, however, other liquid combustible materials such as paraffin oil are possible. Also, pasty combustible materials can be used.

According to one preferred embodiment of the invention, wafer-like wax or paraffin elements are used as combustible material, which have a thickness of about six mm for example, and an outside diameter of thirty-eight mm and contain a central drilled hole through which the wick can be passed. The central hole can be formed at least in part in a conical shape, so that the upper end of the wick will always have sufficient free space to be ignited and to supply a well-burning flame.

For example, if a long-burning lamp according to this invention with three wafer-like combustible material elements stacked one upon the other is ignited, then the combustible material such as paraffin will begin to melt, as is known, in the immediate vicinity of the flame and will flow to the wick, for example, through a vertically running slit in the tube surrounding the wick. Gradually, all three paraffin wafers will melt entirely, so that the combustible material located in the dish-like vessel is entirely liquid. As soon as the combustible material is consumed, the flame will go out. Additional ring-shaped wafers of combustible material can be installed, whereupon the wick can be ignited again. Since the wick is often entirely or mostly burned up, when the lamp is ignited again, the ignition flame should be set up or maintained long enough so that during ignition, combustible material such as wax will melt off and flow to the wick.

If the long-burning lamp according to this invention is extinguished before the combustible material located in the dish-like vessel is consumed, then before relighting the lamp, individual, ring-shaped wafers of the solid combustible material can be added. The addition of new fuel should take place after the combustible material remaining in the dish-like vessel has solidified.

If the top ring-shaped wafer is intended to protrude above the outer end of the wick tube, then it is useful to position the top, ring-shaped wafer of combustible material so that the cone of the central opening is expanded outward. But if the top of the added combustible material wafers is to be located roughly at the same height or below the upper end of the wick tube, then it would be useful to position the top wafer of combustible material so that the cone of its central opening is expanded downward. Alternatively, the top wafer can be broken apart in half, in particular if it has a corresponding fracture line, so that only one half of a wafer is added to the lamp as top layer and the flame is exposed on one side where the liquid combustible material melted from the half wafer of combustible material can flow off.

It is important that sufficient combustible material can liquefy as quickly as possible in the immediate vicinity of the burn zone of the wick supply the flame without too much combustible material liquefying so as not to smother the flame and cause the lamp to go out.

The wick itself is equipped on its surface with vertical grooves, for example, which act as capillary tubes in conjunction with the tube surrounding the wick. The liquid or liquefied combustible material can rise up through these grooves or even through tiny drilled holes within the wick to the upper end of the wick in order to supply the flame with combustible material.

Alternatively, the wick can also contain tiny drilled holes in the form of capillary tubes, through which the liquid wax will rise up before it evaporates in the vicinity of the upper end of the wick and supplies the flame with combustible material.

Finally, it is also possible to design the wick or the wick holder with a polygonal cross section and to set the wick and wick holder cylindrically opposite each other in order to create space between them for the ascending liquid combustible material.

According to another preferred embodiment, the wick tube is equipped with a three prong or multi prong or serrated wick holder which is positioned parallel to the bottom of the cut and preferably resting upon this bottom, in order to keep the wick in the middle and thus centered in the dish. But the wick holder can also be round.

The dish can be equipped with a cover containing a central hole, so that a lamp specified in this manner will have a particularly decorative effect. The central opening located in the cover can have many different shapes, for example, a star-shape, heart-shape or circular shape.

Potential candidates for the inorganic material for the wick are, for instance, gypsum, chalk, clay, cement, glass wool, glass silk, slag wool, rock wool and similar items. Also, mixtures containing at least one inorganic material can be used. A mixture of clay with an inorganic binder such as water glass has proven particularly suitable.

The particular advantages of the invented, long-burning lamp are that during the burn, it produces virtually no soot, that the flame is always burning above the vessel and does not drop down in the vessel with the consumption of the combustible material, that no overheating of the lamp is possible and that the long-burning lamp is very environmentally friendly, because the dish-like vessel and the wick including wick holder can be reused and thus need not be discarded only after a one-time use.

Additional advantages of the long-burning lamp according to this invention are that the wick holder is centered in the dish-like vessel and thus cannot slide off to the side or tip over and thus go out, so that decorative covers can be used which guarantee an attractive appearance and numerous and versatile designs. Because the combustible material can be replenished without having to replace the dish-like vessel or the wick, a low-cost, efficient operation is possible. If the invented long-burning lamp is used as a kind of Rechaud tea light, the added advantage is obtained that the flame always has the same distance from the bottom of the mounted can or pan, so that a uniform heat output is assured and thus also a uniform heat utilization.

The long-burning lamp according to this invention can be designed as a kind of hourly burner, where the dish-like vessel can also consist of transparent material. In this case, the perpendicular wall or the mantle of the vessel can protrude upward over the outer end of the wick and additionally be covered by a perforated cover, so that a certain amount of wind protection is provided.

The wick need not be made exclusively of inorganic material, rather the wick material can also contain organic substances, such as wood charcoal, wood dust, cellulose and such. These supplemental, organic materials burn in the combustion zone of the wick, where the temperature is sufficient, so that within the wick in the combustion zone, cavities are produced which increase the suction capacity of the wick. It is important that a structure of inorganic material remain in the wick in order to maintain the configuration of the wick.

The most interesting inorganic materials for the wick are gypsum, cement, clay, glass wool and glass silk.

As combustible material we can use paraffin, stearin, waxes and liquid fuels, such as paraffin oil. The solid fuels can be used in granulate form, pasty form or as premanufactured combustion elements, such as wafers. In this case, the solid combustible material or the solid fuel can also be colored, which may be of interest in particular when the dish forming the outer sheath is transparent or at least translucent (opaque).

If pasty or plastic fuel is used, then a fuel with lower softening and melting point than paraffin can be used, so that tea lights or other long-term burners with larger diameters are possible, than is presently the case for use of solid (at standard temperature) paraffin as fuel.

An additional advantage of the long-burning lamp according to this invention consists in that the wick cannot tip over and be extinguished in the liquid or liquefied fuel.

The dish-like vessel of the invented long-burning lamp can also be made of plastic, such as transparent plastic, and in the center an inward protruding pin can be molded on, on which a tube acting as wick holder can be placed. In the region of this pin, on the outside of the vessel, a downward open hole can be provided which makes it possible to place the long-burning lamp on a rod or pin located on a holder.

If the dish-like vessel consists of transparent material, which can also be dyed or colored, when the flame is burning a particularly decorative effect is achieved, which can be enhanced by the coloration of the transparent material and/or the coloration of the combustible material.

The dish-like vessel of the invented long-burning lamp can be made of plastic, for example, without any reservations—in contrast to known tea lights—because the flame is always burning above the vessel or at its upper end, and thus for this reason does not come into contact with the vessel itself. If a cover of noncombustible material such as metal is set on top, an additional protection of the plastic vessel can be provided. No overheating will be possible. Also,

foreign objects located in the long-burning lamp, such as residues of matches and such, and which may have fallen to the bottom of the dish-like vessel, will not be ignited because the flame is always burning at the upper end of the noncombustible wick and thus will not get to the bottom of the vessel.

Inside the dish-like vessel, on its bottom, we can install a heat conducting layer such as aluminum foil, which will conduct the heat from the wick holder outward, so that the fuel located in the vessel will be totally consumed and can flow to the lower end of the wick.

According to one preferred design of the invention, the wick holder can be lined at least along a portion of its length with a foil of glass fiber mat which surrounds the wick and thus forms a holder for it. This will ensure that sufficient liquid or liquefied fuel will always be sucked into the burn zone of the wick, in particular when the dish-like vessel has nearly burned empty. The foil should be set back a little from the upper edge of the wick holder designed in the shape of a little tube, for example, by two to three mm, in order to form a ring-like cavity within the wick holder around the wick, in which combustion residues falling from the wick will land.

The longitudinal slit located in the tube-like wick holder should be only a few hundredths of a millimeter wide, in order to prevent the flame from creeping downward on the outside of the wick and of the wick holder when the vessel has burned nearly empty.

Preferably the wick has a point at least at one end. However, if it has a point on both ends, then in case the one end should fail for any reason whatsoever, then it can be extracted from the holder, inverted and reinstalled in the reverse position, if the user does not wish to replace it. Thus the wick can have a circular cross section, or can even be polygonal or rectangular. In the case of a polygonal or multiangular cross section, the advantage attained is that cavities will remain around the wick within the tube-like wick holder which will additionally promote the uptake of the liquefied fuel.

Since the only part subject to wear in this invention is the wick itself, which can and should be replaced only after numerous hours of operation, that is, after it fails to function, whereas the other parts of the long-burning lamp—namely the dish-like vessel, the wick holder and any installed ring-shaped washers—can be replaced after extinguishing the flame, the advantage is that the long-burning lamp according to this invention is particularly environmentally friendly, since little waste is created.

The casing-like or tube-like wick holder according to this invention can be equipped with a casing ring set upon it, which can slide upward or downward at the upper end on the wick holder. By displacement of this casing ring, the height of the flame can be adjusted in order to tailor the flame to the softening point or melting point of the fuel and to the thermal conductance of the material of the wick holder and to additional parameters of the long-burning lamp. Like the tube-like wick holder, the casing ring contains preferably a narrow, longitudinal slit of only a

few hundredths of a millimeter wide. Alternatively, the wick can also be pulled out somewhat from the wick holder in order to change the height of the flame.

The wafers made of solid fuel such as paraffin and intended to replenish the fuel supply can have different shapes. For example, they can be bulged on the bottom and can be hollow on top. Thus, the ring-shaped wafers will be roughly adapted to the surface of the hardened fuel remaining in the dish-like vessel. They can also have protrusions serving as spacers or can be powdered in order to keep them from sticking together.

If the fuel is pasty or plastic at standard temperature, then it can be delivered in the shape of cylindrical rods of two hundred mm length and with a diameter of eighty three mm, for example, and have a central hole. The end user has to cut from the rod individual pieces with a length corresponding to the height of the fuel to be replenished in the dish-like vessel.

Sample designs of the long-burning lamp according to this invention are illustrated schematically in the figures. We have:

Figure 1, a vertical cross section through one embodiment of this long-burning lamp,

Figure 2, a top view of the cover of the long-burning lamp which features a central, circular opening,

Figure 3, a top view of a modified cover of the long-burning lamp which features a central, star-shaped opening,

Figure 4, a vertical cross section through a paraffin wafer suitable for the long-burning lamp in Figure 1 (shown somewhat enlarged),

Figure 5, a vertical cross section through a paraffin wafer modified somewhat in comparison to Figure 4,

Figure 6, a side view of a wick for the long-burning lamp from Figure 1,

Figure 7, a top view of the wick from Figure 6,

Figure 8, a top view of a plate-like wick holder with which the wick can be held centrally in the dish-like vessel of the long-burning lamp from Figure 1,

Figure 9, a vertical cross section of a wick modified in comparison to Figure 6,

Figures 10 to 12, different wick points for the wick from Figure 9, each shown in vertical cross section,

Figure 13, a cross section through another wafer consisting of solid fuel (at normal temperatures) which has a bulged underside, and

Figure 14, a vertical cross section through a replaceable long-burning lamp according to this invention, modified in comparison to Figure 1, which is set up on a pedestal stand.

A long-burning lamp 1 illustrated in particular in Figure 1, has a dish-like vessel 2 which can be covered with a removable lid 3. Both the dish 2 and also the lid 3 can be made from sheet metal.

In the middle of the vessel 2 there is a wick 4 which is made of inorganic, noncombustible material and whose point 5 extends beyond the lid 3, as Figure 1 shows. For this purpose, the lid 3 contains a central opening 6 or 7 which has the circular-shape according to Figure 2 or the star-shape according to Figure 3.

The long-burning lamp 1 is designed as a kind of tea light. In its vessel 2 there are wafers 8 of combustible material which can be of paraffin or wax. The outer diameter of these combustible material wafers 8 is adapted to the inner diameter of the dish-like vessel 2 with a circular perimeter, so that the wafers 8 can be set into the vessel 2 with little free play and can also be replenished in the same manner. The thickness of the individual wafers 8 has been selected so that a number of wafers will fill the dish-like vessel 2 with solid combustible material, whereby a wafer broken in half as top wafer can also protrude above the upper edge of the vessel so that the wick when ignited, will be quickly supplied with liquefying or liquefied combustible material.

From Figures 4 and 5 it is evident that each combustible material wafer 8 has a central opening 9 or 10 whose smallest diameter is somewhat greater than the outer diameter of the wick 4 (with its roughly cylindrical perimeter), so that the wafers 8 when placed into the dish-like vessel 2, can be pushed over the wick located there.

In the embodiment according to Figure 4, the opening 9 is designed as a cylindrical hole which has a conical recess 11 at its upper end (seen in the figure) which expands the opening 9 significantly at one end.

According to Figure 5, the central opening 10 of the wafer 8 is designed overall as a cone, so that the opening on one side of the wafer is narrower than at the other side.

The combustible material wafers 8 represented in detail in Figures 4 and 5 can be placed into the dish-like vessel 2 with the wide or the narrow end of their central opening 9 or 10 facing up or down, depending on whether a broader or a more narrow, central opening is needed at the upper end of the stockpile of solid combustible material located in the vessel 2.

As is evident in particular in Figures 6 and 7, the base element of the wick 4 having an essentially cylindrical base element is housed in a little tube 12 made of metal, from whose upper end only the point 5 of the wick 4 is protruding. This little tube 12 is made of sheet metal whose side edges rest tightly against each other but are not joined together, so that with respect to cross the entire height of the tube 12, a narrow groove 13 with a width on the order of hundredths of millimeters is left open, in which the liquefying or liquefied combustible material can flow upward across the outer side of the wick 4 to its point 5, in order to supply the flame (not illustrated in the drawing) with combustible material.

As an alternative, or as an addition, grooves running in the longitudinal direction can be cut in the mantle-shaped surface of the cylindrical wick 4 in which the liquefied combustible material can rise up to the point 5.

The tube 12 is provided at its lower end with a radial flange 14 which acts as a kind of base and ensures that the wick 4 in the position illustrated in Figure 1 will stand within the dish-like vessel 2, and specifically when the combustible material located in the vessel 2 is entirely liquefied and even when this fuel is entirely consumed.

In order to keep the wick 4 centered in the dish-like vessel 2, a centering wafer 15 can be set onto the tube 12, which for this purpose has a diameter corresponding to a central hole 16. As Figure 8 shows, the centering wafer 15 is of essentially triangular shape, and the outer edges 17 of the three arms 18 of the centering wafer 15 rest on an arc which coincides roughly with the inner diameter of the dish-like vessel 2, but is somewhat smaller in order to assure sufficient free play. Thus the centering wafer 15 can hold the wick 4 centered in the dish-like vessel 2.

It is also evident from Figure 6 that an annular sleeve 33 is seated on the tube 12 serving as a wick-holder; said sleeve can be displaced in the longitudinal or axial direction so as to adjust the length by which tip 5 of wick 4 projects from the tube constituting the holder and thus also be able to adjust or vary the height of the flame, not shown here. Alternatively, one can also change the depth to which the wick is inserted or pushed into the tube.

From Figure 6 it is also evident that the wick 4, which has a circular cross section, but which can also be a polygon or rectangle, is provided at both ends with a point 5.

Since the wick 4 can be displaced in the tube 12 of the holder and thus is replaceable or reversible, optionally either one of the two points 5 of the wick 4 can point upward and be used as the burning wick end.

In the embodiments according to Figures 9 and 10, the wick 19 consists of a perforation element of inorganic, noncombustible material which is inserted into the upper end of the tube 12. In the lower region of the tube 12 there is a filling 20 of glass wool which can be saturated with combustible material. This fuel can rise up through tiny grooves 21 and 22 cut into the surface of the wick 19 from the tube 12 across a perimeter bulge 23 to the point 24, where the combustible material arrives virtually gasified and supplies the flame (not illustrated here) with combustible material.

Whereas the wick 19 formed as insertion element is equipped in the embodiments according to Figures 9 and 10 with tiny grooves 21 and 22 located on its outside, the wick 25 in the embodiments according to Figures 11 and 12 is likewise designed as an insertion element and has one or more thin drilled holes 26, through which the liquid combustible material will rise due to capillary action and in which it can gasify before it reaches the point 27 and thus the flame (not illustrated) burning there.

The wicks 19 and 25 are suitable preferably for the combustion of liquid combustible material such as paraffin oil, however, they can also be used in long-burning lamps which are intended for use with combustible material such as paraffin or wax which is solid at room temperature. In the latter case, care must be taken that the central drilled hole 9 or 10 in the combustible material wafers 8 used in the long-burning lamp have a greater inside diameter than the outer diameter of the perimeter bulge 23 of the wick 19 or 25.

Figure 13 presents a wafer 34 consisting of solid combustible material or fuel, which has a ring-like shape and contains a central opening 35 of uniform cross section going all the way through. This wafer 34 has a bulged, outward pointing or convex surface 36 in the ring zone running around the opening 35, and a corresponding bulged or concave, opposing surface 37, so that wafers 34 of this kind can be adapted to the more or less concave surface of a solidified residue of fuel located in the dish-like vessel of the long-burning lamp, and several wafers of this kind can also be set onto each other or stacked one upon the other in a centered manner.

In the embodiment shown in Figure 14, a removable long-burning lamp 38 is set onto a standardized base 39. The base 39 has a wafer-like support plate 40 at its upper end for this purpose, and a centering pin 41 extends upward from its center.

The long-burning lamp 38 has a dish-like vessel 42 which is made of plastic, for example, of molded plastic. At the bottom 43, in its center, there is a cylindrical shoulder 44 extending into the dish 42; this shoulder is formed as a single piece with the vessel 42 and contains a downward or outward open, central hole 45 in which the centering pin 41 of the base 39 will fit.

Within the dish-like vessel 42 on the cylindrical shoulder 44 there is a tube 46 acting as wick holder, which is designed similar to the tube 12 shown in Figure 6 and which has at its lower end a horizontal flange 47 resting on the base 43 of the vessel 42.

There is a replaceable wick 4 with two points 5 having the design described above inserted into the tube 46, and the downward pointing point 5 of the wick 4 can rest upon the upper end of the cylindrical shoulder 44, which thus forms a stop which determines the maximum insertion depth of the wick 4.

The inner diameter of the cylindrical tube 46 is greater than the outer diameter of the wick 4. The tube 46 is lined with glass fiber mat 48 which promotes the ascent of liquefied fuel, due to its porosity, across the outside of the wick 4.

The glass wool 48 forms a lining of the tube 46 and it terminates below the upper edge of the tube 46, so that in the upper region of the tube 46, between it and the detachably inserted wick 4, a ring-like cavity 49 remains, into which any particles or dirt from the wick can fall.

On the bottom 43 of the vessel 42 of circular perimeter there is a foil 50 nearly covering the bottom surface, or a thin piece of heat conducting sheet metal, for example, an aluminum

foil, in order to distribute the heat from the flame 51, said heat moving downward from the tube 46 made of heat conducting material such as metal, across the bottom 43, in order that regions of the vessel 42 located far from the flame 51 which hold fuel in the vessel 42 will melt completely and can be used to supply the flame with fuel. The foil or bottom wafer resting on the bottom is round or circular (seen from above), and its outer diameter is somewhat smaller than the inside diameter of the vessel.

Inside the dish-like vessel 5 [sic; 42] there is fuel in the form of wafers 52 placed one upon the other; these wafers can be replenished as needed.

At the upper end of the dish-like vessel 42 there is a removable cover 53 having the shape of a ring washer, and it is made of a noncombustible material like metal, and has a relatively large central opening 54 so that the flame 51 will not collide with the cover 53 or will not be impacted by this cover.

The combustible material wafers are designed as compressed blanks and can be provided on top and bottom with protrusions or shoulders which ensure a certain distance from the next wafer, in order to prevent the stacked wafers from sticking together. The wafers can also be powdered for this purpose.

Claims

1. Long-burning lamp with a dish-like vessel in which a wick is located and which is filled with solid or pasty (at room temperature) or with liquid combustible material, characterized in that the wick (4; 19; 25) consists at least partly or predominately of inorganic, incombustible material.

2. Device according to Claim 1, characterized in that the wick (4; 19; 25) consists of inorganic materials such as gypsum, chalk, clay, cement, glass wool, glass silk or similar material or mixtures which contain at least one of these materials.

3. Device according to Claim 1 or 2, characterized in that the wick (4; 19; 25) is a rod-like, solid cylindrical or polygonal element having a point (5; 24; 27) and is made of the inorganic material which is inserted into a metal sheath (12) which features in its cylindrical-shaped mantle surrounding the wick element, at least one opening (13) for the passage of liquid or liquefied combustible material, where the upper end or the point (5; 24; 27) of the wick (4; 19; 25) protrudes at variable length above the upper end of the sheath.

4. Device according to Claim 3, characterized in that the sheath (12) is a cut-open tubular element or consists of a round or polygonal curved, rectangular piece of sheet metal whose mutually opposing edges rest at a small distance (13) from each other.

5. Device according to Claim 3 or 4, characterized in that the sheath (12) contains a wick (4) extending essentially over its entire length, said wick can extend within the sheath along a portion of its length in a porous lining (48).

6. Device according to Claim 3 or 4, characterized in that the sheath (12) contains a wick (19; 25) in its upper region and its lower region is filled with fibrous material (20) such as glass wool.

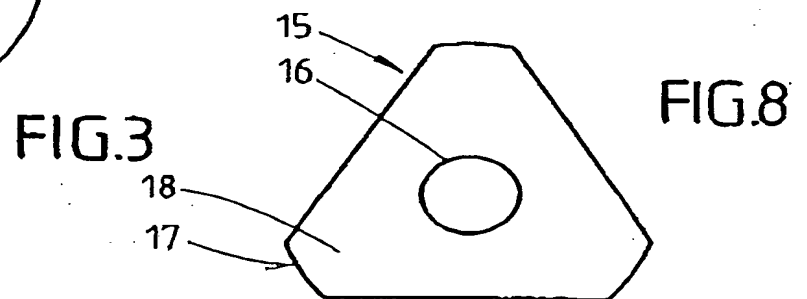
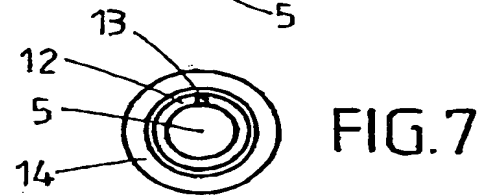
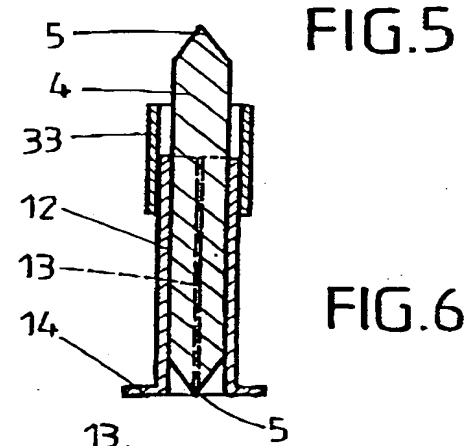
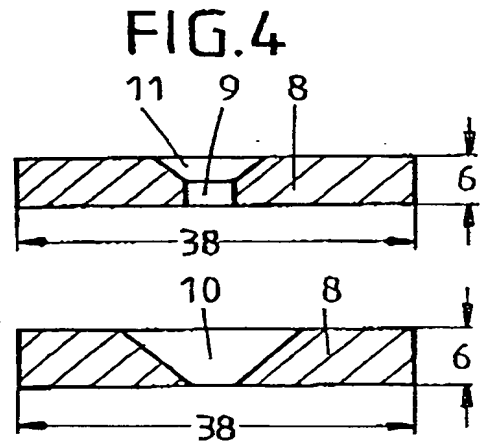
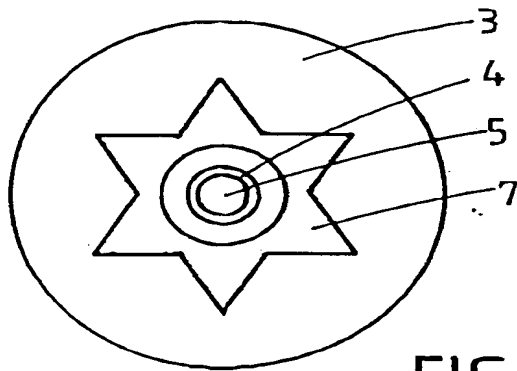
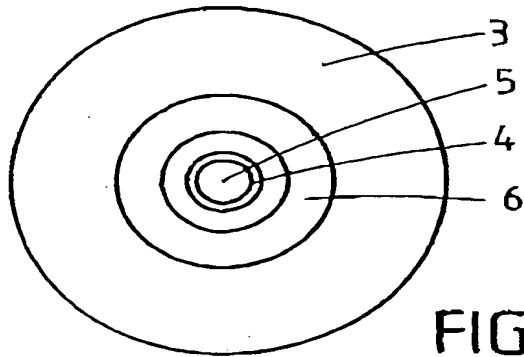
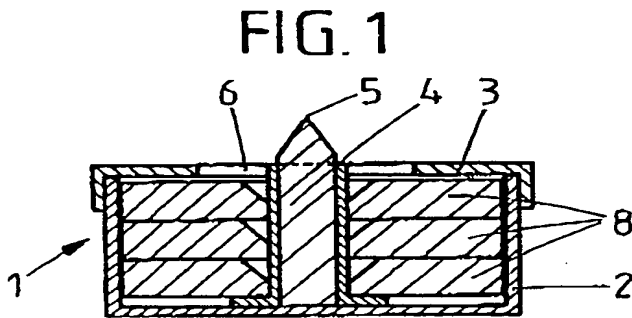
7. Device according to one of Claims 1 to 6, characterized in that at the lower end of the wick (4; 19; 25) on the sheath (12) there is a horizontally extending spacer (15) that features several spacer arms (18) that end near the inner wall of the dish-like vessel.

8. Device according to one of Claims 1 to 7, characterized in that in the dish-like vessel (2) there are several wafers (8) of combustible material one upon the other, which surround the wick (4; 19; 25) and contain a central opening (9; 10) for the wick.

9. Device according to Claim 8, characterized in that around the central opening (9; 10) of the combustible material wafer (8) on at least one side of the wafer, some combustible material has been removed so that conical-shaped, hole-shaped, star-shaped and similar recesses are provided.

10. Device according to Claim 8, characterized in that the combustible material wafer (8) features at least one fracture line or a defined fracture site promoting its fracture, said fracture line bisecting its central opening (9; 10), in order to allow breakage of the wafer into two pieces, for example, before its use.

11. Device according to one of Claims 1 to 10, characterized in that the wick (4; 19; 25) features grooves (21; 22) acting as capillaries, and/or drill holes (26) for combustible material rising up to the point (5; 24; 27) or up to the upper end of the wick.



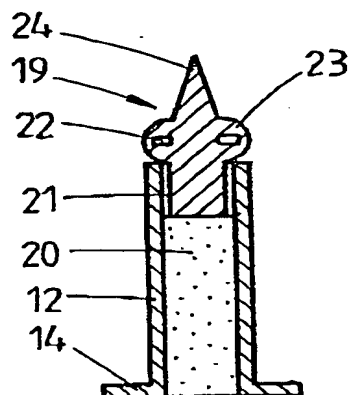


FIG.9

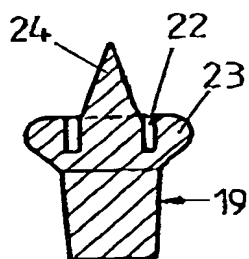


FIG.10

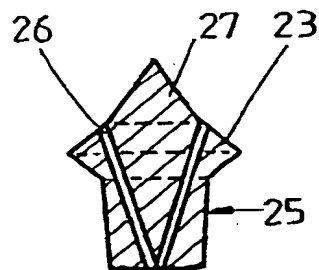


FIG.11

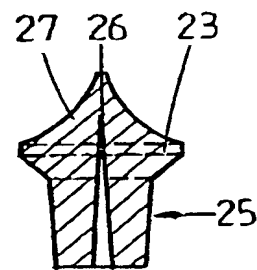


FIG.12

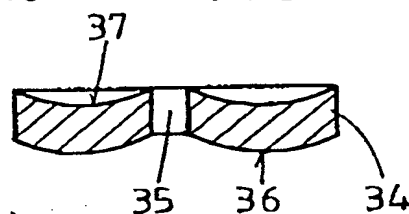


FIG. 13

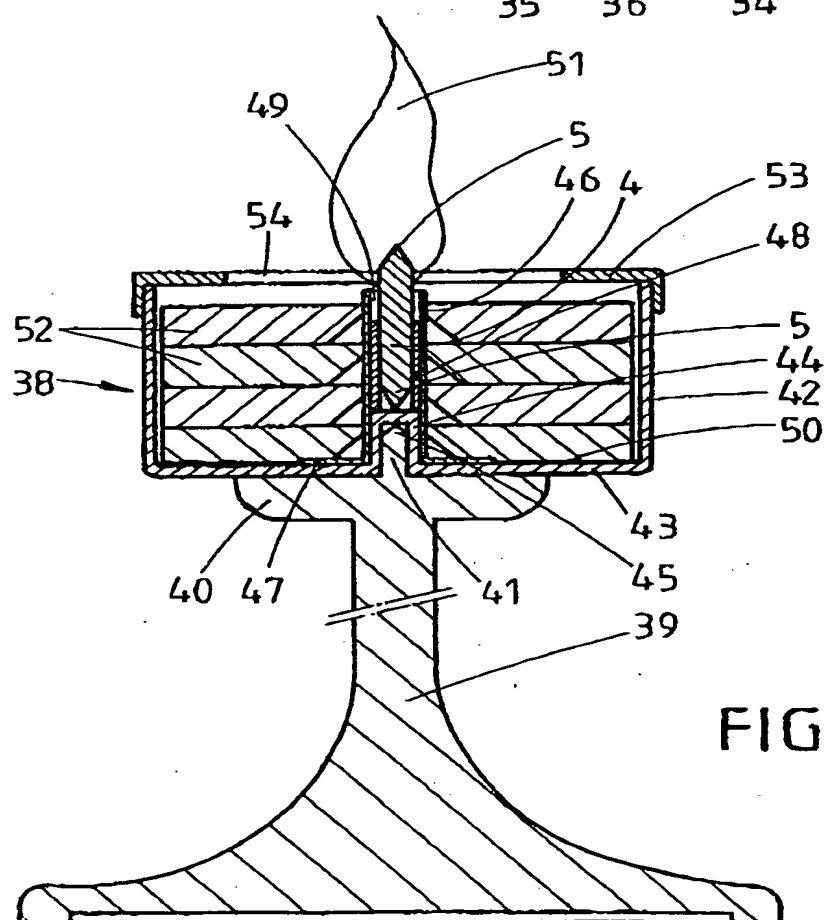


FIG.14